ORIGIN AND DEVELOPMENT OF THE TENNESSEE COAL, IRON AND RAILROAD COMPANY

Tennessee Coal, Iron
and Railroad Company

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Origin *and* Development *of the* Tennessee Coal, Iron *and* Railroad Company

ROBERT GREGG

BLACK GOLD

"Were American Newcomen to do naught else, our work is well done if we succeed in sharing with America a strengthened inspiration to continue the struggle towards a nobler Civilization— through wider knowledge and understanding of the hopes, ambitions, and deeds of leaders in the past who have upheld Civilization's material progress. As we look backward, let us look forward."

—CHARLES PENROSE
Senior Vice-President for North America
The Newcomen Society of England

This statement, crystallizing a broad purpose of the Society, was first read at the Newcomen Meeting at New York World's Fair on August 5, 1939, when American Newcomen were guests of The British Government

"Actorum Memores simul affectamus Agenda"

ORIGIN *and* DEVELOPMENT *of the* TENNESSEE COAL,
IRON *and* RAILROAD COMPANY

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AMERICAN NEWCOMEN, *through the years, has honored the memories of men whose pioneer vision, undaunted determination, and courageous Faith have made possible the beginnings of what have developed into great industrial enterprises in the United States of America. What these men undertook and carried through with ultimate success has meant countless contributions to the development of our Nation's natural resources, our industrial welfare, and our national economy. Such a Newcomen manuscript is this dealing with large-scale mining and industrial operations, begun before the War between the States and carried forward—in Tennessee and in Alabama—and now part of steel production capacity unequalled anywhere else in the World. It is a recital of rare human interest.*

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ROBERT GREGG

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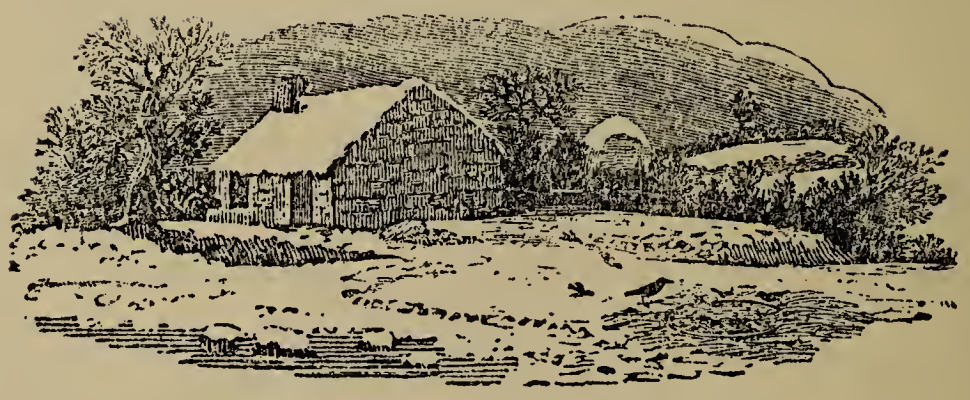

This Newcomen Address, dealing with the beginnings and growth of Tennessee Coal, Iron and Railroad Company, was delivered during the "1948 Alabama Dinner" of The Newcomen Society of England, at which Dr. Gregg was guest of honor, held at Mountain Brook Club, near Birmingham, Alabama, U.S.A., on December 7, 1948

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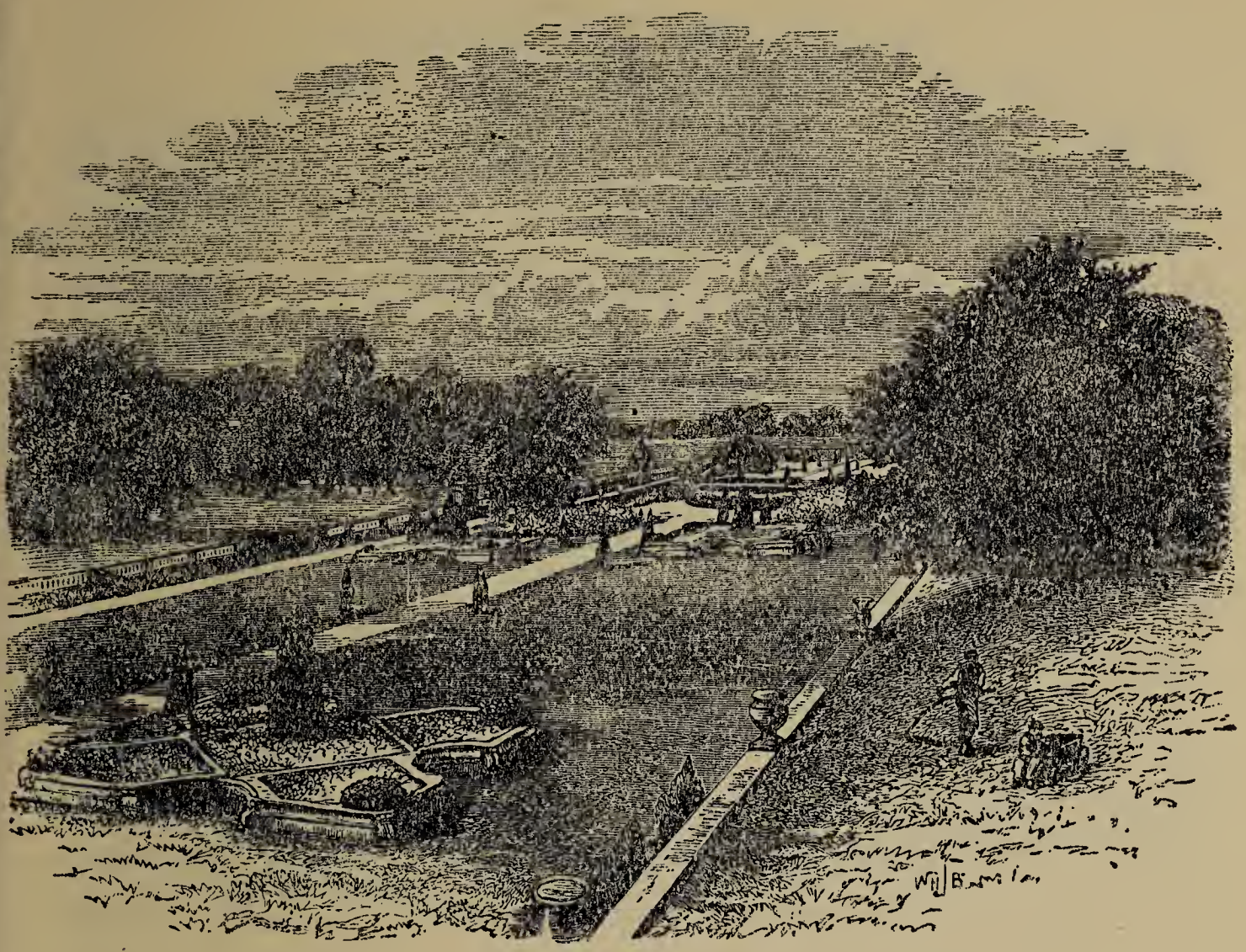

"The Tennessee Coal, Iron and Railroad Company was born in a foxhole in the Cumberland Mountains of Tennessee.

"Until the middle of the Nineteenth Century, most of that country between Nashville and Chattanooga was practically undiscovered ground save only to hunters and trappers and the few hill folk born and bred in that mountain area."

—Robert Gregg

Biographical Sketch of The Author

"Blessed of the LORD *be his land, and for the chief things of the ancient mountains and for the precious things of the lasting hills." Words of the Prophet of old well apply to treasures of coal, limestone, and ore that have brought wealth from the hills to Alabama and to Birmingham, leading industrial city of the South! In 1870, the site of the city was a cornfield crossed by two railways. Today, here center the operations of Tennessee Coal, Iron and Railroad Company, subsidiary of United States Steel Corporation. These operations have made Birmingham great.* DR. ROBERT GREGG, *President of Tennessee Coal, Iron and Railroad Company, is a native of Georgia; a graduate of Georgia School of Technology, in the Class of 1905, and of Cornell University, in 1906, with degree of Mechanical Engineer; and, today, one of the best known executives in the Steel Industry in America. Former President of Atlantic Steel Company, at Atlanta, he became identified with Tennessee Coal, Iron and Railroad Company in 1932. With broad interests in industry, finance, and general business, he has rendered important service in citizenship and in civic causes. Member of technical and engineering bodies, he has taken active part in support of professional education and the advancement of scientific knowledge. His lifework truly may be said to center in "the chief things of the ancient mountains and the precious things of the lasting hills." Whereby Alabama and the entire South have been enriched. Steel executive, authority on production, student of industrial history, good citizen, Dr. Gregg is a Vice-Chairman of the Alabama Committee, in The Newcomen Society of England.*

HIS MARK

My fellow members of Newcomen:

THE HISTORY of industry in these United States is replete with instances of simple beginnings and slow growth in early stages. This is less common today than it was one hundred years ago, which is the period of birth of the industrial organization about which I have the privilege of telling you tonight.

The Tennessee Coal, Iron and Railroad Company was born in a foxhole in the Cumberland Mountains of Tennessee.

Until the middle of the Nineteenth Century, most of that country between Nashville and Chattanooga was practically undiscovered ground save only to hunters and trappers and the few hill folk born and bred in that mountain area. With the talk of a railroad to be built connecting these two cities came the desire of at least one inquisitive soul to ascertain what might lie in this almost virgin area. So we find a young Irishman by the name of Leslie

Kennedy tramping the miles of mountain and valley on an expedition of discovery.

After many days of wandering, he found something which bore all the aspects of a real business opportunity—coal so close to the surface that it broke through the top-soil in spots. Promptly returning to Nashville with specimens of his find, he sought partners with faith and finances in sufficient quantities to make real his dream of an important development; but no one could be found who was interested sufficiently to join him—no one, that is, except William N. Bilbo. William N. Bilbo was a lawyer, a very picturesque personage and deemed by many to be an odd character, to say the least. It is related of him that he led the fashions of ante-bellum Nashville with his elaborate waistcoats, long burnside whiskers, and elegant manners.

Already noted as distinctly an odd character, William N. Bilbo had no hesitancy in taking hold of craggy mountain land. He set forth on a journey of exploration with young Kennedy, saw the coal where it outcropped, and realized the possibilities that lay in this great plateau.

Over in Grundy County the two partners in exploration ran upon one Benjamin Wooten, himself one of the characters of that region, who was digging coal, hauling it down the wagon roads to the many blacksmith forges, and realizing ready cash for his efforts.

He related that his boys had found the coal first while out fox hunting. The fox had sought refuge under the stump of a blown-down tree and in digging for him the boys struck the "black stones," pieces of which they took to the father who promptly recognized the material as coal. He then got a grant of three hundred acres of land around that old tree stump, and had dug coal for some time.

Mr. Bilbo acquired the Wooten property for a fair consideration. He also secured large acreages lying along the plateau, some by option, some by purchase, some actually by gift, as some owners were glad to part with it as a tax-saving measure.

Some idea of the then value of the property is gained from a statement made by Colonel A. M. Shook in an address in 1887, in which he said: "Men would not buy the lands even at twelve and one-half cents per acre and pay taxes on them."

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When the people in Nashville learned what Bilbo was doing, they were confirmed in their belief that the lawyer indeed was daffy. However accurate their verdict might have been in their own estimation, the fact is that Mr. Bilbo hastened to New York where his story fell upon attentive ears, with the result that he returned to Nashville with four capitalists and a civil engineer, for an inspection at first hand of his acreage.

Entirely satisfied that a very substantial tonnage of coal was available, the visitors purchased the interests of Mr. Bilbo, who thereupon retired from coal prospecting, content to devote his remaining years to the practice of law and to enjoy the fifty thousand dollars profit earned on his venture into the Cumberland Mountains.

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Chief among the new owners was Samuel F. Tracy, who became President of the Sewanee Mining Company, a corporation formed to develop the coal properties purchased from Mr. Bilbo. It is of interest to note that the legislative act which created the Sewanee Mining Company was passed by the General Assembly of the State of Tennessee on February 10, 1852, and covered the incorporation of three other companies.

Section 7 of that Act began with the following language: "Be it Enacted that John M. Daw, William Warne, J. Bridges, and Nicholas Fesedder, their associates and successors, are hereby constituted a body politic and corporate, by the name of the Sewanee Mining Company, for the purpose of exploring for lead, copper, iron, coals, and other ores, metals, and minerals, and for mining, working, smelting, and vending the same." Thus the corporate progenitor of the Tennessee Coal, Iron and Railroad Company came into being.

A short time after its incorporation, the Company began construction of a railroad from the Nashville, Chattanooga & St. Louis Railroad near Cowan, Tennessee, to a coal seam on the top of the Cumberland Plateau, to which the name Sewanee was applied. The term "Sewanee" is supposed to be the Indian word for "Big Mountain."

The length of the railroad was about 10 miles, and on account of the heavy grades to be overcome in a relatively short distance, the problems involved in its construction were most serious. It was completed in 1855, and the first coal was shipped over it in the following year.

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At the point where the mine was opened, the coal seam was thin and found to exist throughout only a small area; therefore, it became advisable to extend the railroad 10 miles farther to what now is known as Tracy City, named for Samuel F. Tracy, the then President of the Sewanee Mining Company. The railroad extension was completed in time for the first carload of coal to be shipped from the Tracy City Mine on November 8, 1858.

From that time until the outbreak of the War Between the States, operations were conducted on a very limited scale as it was found that the available market would not require as much as two carloads of coal per day.

This lack of market, together with the large expenditures made necessary by the extension of the railroad and the opening of the Tracy City Mine, brought financial embarrassment to the Company, with several suits filed against it by creditors.

The outcome of these several suits was a series of judgments rendered against the Company, resulting finally in the judicial sale of the property by virtue of which the title to all of the assets became vested in the creditors.

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In order to protect their interests, the largest creditors, with some of the stockholders of the Sewanee Mining Company, decided to reorganize the Company. To that end, they secured the

passage of an Act by the General Assembly of Tennessee authorizing incorporation of the Tennessee Coal and Railroad Company, with all the rights and privileges that previously had been granted the Sewanee Company in its charter of 1852.

This Act was passed on March 24, 1860. I should like to pause here long enough to point out that our inquisitive young Irish friend, Leslie Kennedy, had been an employee of the Company, which was the product of his initiative, and finally resigned his position as Mine Superintendent, or "Mining Captain" as it was then officially designated, on September 5, 1860.

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The first Board of Directors of the new Tennessee Coal and Railroad Company was composed of 10 men from New York and two from Tennessee, with Mr. Thomas Richardson of New York as President.

At a meeting of the Directors in New York on September 4, 1861, notice was received of a levy upon the Company's property under a decree of the Supreme Court of Tennessee. At the same time a report was submitted stating that "by the usurpation of rebel authorities" the functions of the United States Courts had been suspended and the Company "had been despoiled of its property."

By order of the Directors, all funds then on deposit in The Bank of The Republic were withdrawn, and invested in United States Government securities, except for a small sum required for current expenses.

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During the Year 1861, the Confederate Army seized the property and operated the mines and the railroad until that army evacuated Tennessee, taking with it all the equipment of the railroad. In 1862, when middle Tennessee was first occupied by the Federal forces, the property was commandeered by that army and was operated in a desultory fashion until the close of the war in 1865.

May I digress at this point to recall a very important and far-reaching event which took place in 1857, about the time the Tracy City Mine was put into operation.

A convention of Bishops and the clerical and lay representatives of The Protestant Episcopal Church from nine Southern States was held at Lookout Mountain, Tennessee, at which meeting the project of the University of the South was set on foot.

The Sewanee Mining Company gave the new University a domain of approximately 10,000 acres on condition that the college be opened within 10 years. Committees of the Church went to work promptly to secure the money needed for buildings and endowment. So successful were they that in the Spring of 1860 the cornerstone of the main building was laid.

But again the heavy hand of armed conflict fell upon this project, just as it had upon the mining venture, so that with the close of the war all that remained of the University of the South was its charter and its wide domain. In order to keep alive the contract with the Sewanee Mining Company, it is reported that a school was opened in a log cabin with three mountain boys enrolled, in the Summer of 1868, thus saving the gift of the land. This log cabin became known as Rebel's Rest.

In April, 1865, a meeting of the Directors of the Tennessee Coal and Railroad Company was held to elect R. J. Meigs as President, and to decide upon steps necessary to be taken to recover possession of the property. It was found that what remained consisted of parts of the rail of the railroad, a coal mine with mining equipment practically wrecked, and an acreage of coal land with legal title to the property vested in the creditors of Sewanee Mining Company.

Agreement was reached early in 1866 whereby reorganization of the Tennessee Coal and Railroad Company was completed and operations resumed.

The first record available shows production in the first eight months of 1869 amounted to 560,699 bushels of coal, which was sold at a net profit of $7,379.42. Earnings from the Company commissary during that same period amounted to $19,211.67.

In December, 1870, an agreement was made between the Company and the State of Tennessee providing for the lease of 100 convicts to be employed in the mines. The State was to feed and care for the men, while the Company was to provide a barracks for them and pay the State $1.00 per day per convict. It is of interest to note that the use of convict labor under somewhat similar terms was in vogue as late as 1910 here in Alabama.

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In May, 1873, the President of the Company urged the necessity of preparing at once for the production of blast furnace coke, stating that in his judgment a very broad market existed for this product. He further pointed out the intimate relationship between coal and iron and proposed that a portion of the Company's earnings be employed in developing the *iron* of Tennessee.

As a result of this proposal the construction of 120 coke ovens with a capacity of 5,000 bushels per day was begun in the latter part of 1873, and sales agreements were made with two concerns for the purchase of the output.

By the latter part of 1880, officials of the Company had reached the conclusion that coal and coke production alone would not suffice if the further development of the Company was to continue.

In July, 1881, a resolution was adopted by the stockholders authorizing the directors to apply for a change in the name in order to give recognition to the inclusion in its activities of the production of pig iron.

The General Assembly of Tennessee authorized this amendment to the Charter and on September 13, 1881, the name became Tennessee Coal, Iron and Railroad Company.

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About one year prior to this change, the Sewanee Furnace Company had been organized and had acquired some 80 acres of land at Cowan, Tennessee, on which a blast furnace of 50 tons daily capacity was erected. Brown ore from Westpoint, Tennessee, and Bartow County, Georgia, together with coke from Tracy City,

constituted the charge for this furnace; and, by June, 1881, the production of pig iron began.

With the purchase of this property by Tennessee Coal, Iron and Railroad Company, plans for additional iron production were made, such extension of plant to take place at Cowan.

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Instead of proceeding with these particular plans, however, an agreement was reached by December, 1881, whereby all the property of Southern States Coal, Iron and Land Company, Limited, was conveyed to the Tennessee Coal, Iron and Railroad Company for a consideration of certain shares of stock and certain gold bonds of the purchaser.

Through this purchase, the Tennessee Coal, Iron and Railroad Company secured possession of one completed and one unfinished blast furnace at South Pittsburg, Tennessee, each of 200 tons daily capacity, 105 beehive coke ovens at Victoria, Tennessee, two coal mines in operation, a partially developed iron ore mine at Inman, Tennessee, and a large acreage of land in Eastern Tennessee together with a small acreage in Northeast Alabama.

By the Autumn of 1882, the second blast furnace at South Pittsburg had been completed and put in operation, thus providing pig iron from three furnaces, one at Cowan and the two at South Pittsburg.

During 1883, the construction of 130 additional coke ovens was begun at Lone Rock, near Tracy City, making a total of 635 ovens operated by the Company.

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We come now to the next major step in the development of the Company—its entrance into the Birmingham, Alabama, district, coincidental with the beginning of the era of greatest development of that district.

On September 29, 1886, the stockholders approved the execution of a contract which provided for the purchase of the property owned by the Pratt Coal and Iron Company, in Alabama. Provision was made in the capital structure of the Company for the pay-

ment for these Alabama properties and for this further development and enlargement.

By this purchase, the Tennessee Company became the owner of the Linn Iron Company, the Alice Furnace Company, some 76,000 acres of coal lands, 460 coke ovens, two blast furnaces, and about 13,000 acres of land containing seven and one-half miles of the outcrop of the Red Mountain iron ore seam. Also included were certain locomotives, ore and coal cars, railroad trackage, and other assets. Conveyance of these properties was carried into effect on December 28, 1886.

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I have stated that the entrance into the Birmingham District coincided with the era of greatest development here. This is confirmed by many important moves made by interests other than those of the Tennessee Company—not to omit many others, but I must mention the formation of the DeBardeleben Coal and Iron Company, and the birth of the City of Bessemer.

As to the Tennessee Company itself, construction was begun of four blast furnaces, each of 200 tons daily capacity; 1,400 additional coke ovens, four new slopes in the Pratt Seam of coal and about 4,000 acres of land were conveyed to the Ensley Land Company to establish a community to house the employees of the Company. Also, the Ensley Railroad Company was formed to construct a railroad to carry passengers between the new community of Ensley and the town of Birmingham. Contracts were negotiated with the Louisville & Nashville; Alabama Great Southern; and Kansas City, Memphis & Birmingham Railroad, for the extension of their respective tracks to the new furnaces of the Tennessee Company.

A great tribute is due these early developers of this District, because they were men of vision and of courage. The States of the South which were expected to absorb most of the output of these new plants had completely been devastated only twenty-odd years before, and industry and commerce had been compelled to start from nothing in 1865.

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By 1886, the population of the neighboring States of Georgia, Tennessee, Mississippi, Louisiana, and Florida, together with Ala-

bama, totaled only *7,400,000* souls, having increased from 6,700,-000, in 1880. In that same period, gross postal receipts for those same States had grown from $1,719,309 in 1880 to $2,265,000. Thus, while population had increased only slightly more than 10 percent, commercial activity as reflected by postal receipts had increased nearly 32 percent.

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From that time to the present, the Tennessee Company has endeavored to keep pace with or just ahead of the requirements of the market it serves, with additional facilities and improved processes.

During the period of 1887 until 1892, the Company completed the construction work announced at the time of its entrance into the Birmingham District and went ahead with its operations, improving its relations with customers, and refining its capital structure.

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In 1892, three very significant events occurred; first, the acquisition of the DeBardeleben Coal and Iron Company; second, the acquisition of the Cahaba Coal Mining Company which owned also the Excelsior Coal Company; and, third, the official recommendation by the President of the Company to its stockholders that the production of *steel* in the near future would be to the best interests of the Company.

The acquisition of the DeBardeleben Company added "seven blast" furnaces, 1,020 coke ovens, three producing coal mines, two operating slopes in the Red Mountain ore seam and other coal lands, and certain brown ore deposits to the facilities of the Company.

The purchase of the Excelsior Coal Company brought 467 coke ovens, some 44,000 acres of land in the lower Cahaba Coal Basin, together with employees' houses, stores, offices, railroad trackage, and telephone lines.

Thus, by the end of 1892, the Tennessee Company was the owner of about 400,000 acres of land, 17 blast furnaces, and a suf-

ficient number of operating coal mines to raise its daily output of coal to 13,000 tons.

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The third event mentioned is significant in that another forward-looking proposal was offered even at a time of unusual financial stress. While active steps were not taken at the moment of the President's recommendation, the record shows that he and the Directors were convinced of the desirability of entering into the manufacture of steel at a proper time.

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The next step was taken in August of 1895, when the production of basic iron was started on a commercial basis. Several efforts had been made to produce basic iron from Alabama ores, one as early as 1891, when some 300 tons were produced and sold to customers in Massachusetts. This was followed by certain efforts to produce steel, but on a very small scale.

It was in 1897 that a comprehensive report on the subject of open hearth steel production was submitted to the Directors of the Company. For some time, the Company had been selling its basic iron to existing steel manufacturers and with excellent results. As a result of these two factors, on March 8, 1898, the stockholders empowered the Directors to do such things as might be necessary to enter upon the manufacture of steel. A site was provided at Ensley for the erection and operation of a modern steel plant including furnaces, blooming, billet, rod, and rail mills, such operations to be conducted under the charter of a new corporation organized for that purpose called the Alabama Steel and Shipbuilding Company.

In July of that year, an agreement was made with the Wellman Seaver Engineering Company for the furnishing of plans and the supervising of the construction of an open hearth steel plant at Ensley with a capacity of 1,000 tons of ingot steel per day. The original plans called for 10 open hearth furnaces of 50 tons per heat capacity, a blooming mill, billet mill, and a rail mill.

Steel had been made prior to this time in Birmingham and of Alabama raw materials, but on a very limited scale—almost on experimental scale; hence it is fair to say that this new step was the

first large-scale program for the production of steel launched in the District, and again illustrates the vision and spirit of these men.

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By 1898, the population of the neighboring States had grown from 7,400,000 in 1886 to 9,220,000; gross postal receipts had grown from $2,265,000 in 1886 to $4,670,000, and the value of manufactured goods had grown from $287,235,000 to $493,964,000 in about the same period.

Early in 1899, the property of the Sheffield Coal, Iron and Steel Company was purchased. This consisted of three blast furnaces with 60 acres of land at Sheffield, Alabama; 370 coke ovens, and two operating coal mines.

It is of interest now under our present laws to note the comments the President made to his stockholders regarding this purchase. It was made "to eliminate undesirable competition" in the sale of pig iron in certain States where Sheffield had the advantage of water shipment via the Tennessee River, as against the all-rail shipment from the Ensley furnaces.

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Another purchase at that time was that of the property of the Bessemer Rolling Mill Company. This company had a daily capacity of 80 tons of muck bar and 120 tons of finished iron or steel in assorted shapes and sizes. The property was in close proximity to the Bessemer Nos. 1 and 2 blast furnaces of the Tennessee Company, thus enabling the delivery of pig iron to the mill at very low cost.

There were two very good reasons for this purchase. First, it permitted the production of billets smaller than four by four, which was as small as was economically sound to produce on the Ensley blooming mill. Second, it was felt that during slack pig iron markets the entire output of the Ensley blast furnaces would be put into steel ingots, blooms, and billets and the output of at least one Bessemer blast furnace into muck or finished iron. The puddling capacity of the Bessemer plant would be supplemented by billets from Ensley, thus diversifying the products available for sale.

The first steel produced at the new Ensley open hearth was tapped on November 30, 1899, and thus begins another era in the growth of the Company, or, as was written some time thereafter by one intimately connected with the Company: "The Tennessee Company now demonstrated that basic open hearth steel could be successfully and commercially manufactured in the Birmingham District, and that basic open hearth rails could be successfully and commercially manufactured and sold in competition with Bessemer rails. This had never before been done successfully in the United States. A quarter of the century of the reign of Bessemer Steel developed the fact that the country required and demanded a better quality of steel than could be made by the Bessemer process. The iron and steel makers of this country were slowly and reluctantly forced to admit this fact. Then, and not until then did the Birmingham District enter the field as a real competitor."

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As a matter of fact, the first rail rolled at Ensley was in December, 1902. The Years of 1902 through 1905 were marked by changes in equipment to make for greater efficiency, steadily improving steel making practice, and a few major additions, together with the sale of the Sheffield Coal, Iron and Steel Company.

The use of coke oven gas was begun for the first time for the purpose of firing boilers; electrification of mills, shops, and coal mines was begun; shops at the mines were installed; new dwellings for the more comfortable housing of employees were provided, and crushers were installed at most of the ore mines. A new blast furnace at Ensley was authorized, and a program of rebuilding existing Ensley furnaces for a larger capacity actively started.

In addition to the installation of a larger blooming mill engine, a 250-ton mixer and a converter were added to the Ensley Works.

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Two coal strikes occurred in this period, one of fairly short duration in 1902, and one of much more serious proportions in 1904. As a result of this second strike, the Company announced a policy of strictly non-union coal mine operation and, by early 1905, the mines were in full operation on this basis.

To illustrate concretely what was done by the Company for improving and enlarging its facilities, the records show an expenditure of almost $7,500,000 during the five-year period, ended with December, 1905.

In that same period, net earnings were not quite $8,100,000.

Late in the Year 1905, there occurred another one of those many changes in ownership and management of the Company which had marked its existence throughout the years. A syndicate which controlled the Republic Iron and Steel Company acquired the majority of the capital stock of the Tennessee Coal, Iron and Railroad Company and elected a new Board of Directors on December 19, 1905. Under the management thus provided, broad plans for increased facilities and improved operations were formulated.

Purchase of the Birmingham Southern Railway was made in order to provide the Company with terminal railway facilities and internal traffic between its various operations. Thereafter, construction of a six-mile track extension to new coal mines was begun, and purchase of additional locomotives and steel cars authorized.

The construction of a modern steel works and rail mill was started with the announced intention of doubling the then capacity of steel ingot and rail. The plans called for two Bessemer converters, four open hearth furnaces, each of 60-ton capacity, and one 36-inch rail mill having a rolling capacity of 25,000 tons per month.

In addition and to make possible the economical use of this new capacity, the rebuilding of the Ensley blast furnaces was pushed, new slopes on Red Mountain and an additional dolomite quarry were opened. Seven modern coal washers were planned which would permit of the proper cleaning of all the coal needed for coking purposes, thus giving the blast furnaces a superior quality of coke which would result in lower cost pig iron.

During the year, two small basic open hearth furnaces located in the City of Birmingham were leased by Republic Iron and Steel Company to the Tennessee Company, thus adding another 20,000 tons of ingots per year to wholly owned capacity.

New production records were established in 1906, with over 400,000 tons of finished steel, more than 3,000,000 tons of coal, and nearly 1,500,000 tons of ore.

Once again, one must be impressed with the courage and forward-looking ability of the management of the Company.

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The population of the States used heretofore for purposes of showing development of the territory served by the Company had grown from 9,220,000 to 10,700,000; and the value of manufactured goods had increased from $493,964,000 to nearly $900,000,000.

The expansion of facilities of the Company had kept pace with the development of these States with something to spare, as evidenced by its ability to reach out into other markets, including certain foreign countries.

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The Year 1907 was to see a financial panic of serious proportions in the United States. Banks and trust companies failed in many parts of the Nation, and credit everywhere was practically suspended.

As a direct outgrowth of this panic, the most important change in the ownership of the Company with far-reaching effects, took place. The Company was purchased by United States Steel Corporation and thus joined "The Industrial Family That Serves the Nation."

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Much has been written about this purchase, some of it unfavorable, but most of it favorable. Without entering into a discussion of the controversial issues involved, suffice it to say that at that time the Company faced a serious financial problem. It had a floating debt of some $4,000,000. An expert who recently had appraised the Company's facilities estimated that $20,000,000 were needed to rehabilitate the Company financially and competitively. The syndicate which purchased a majority of the capital stock of the Company in 1905, as I mentioned a moment ago, was not prepared

to advance this sum. When overtures were first made by interested parties to United States Steel Corporation to purchase the Company, Judge Elbert H. Gary, then Chairman of the Board, declined. In directing the affairs of U. S. Steel Corporation, he consistently had avoided placing the Corporation in a position where it could be accused of being a monopoly. In this connection, he repeatedly had said: "We are not attempting to build a monopoly, but to perfect a large-scale rounded proposition."

However, after insistent urging that such a purchase would lessen the financial pressure in New York and would aid the general situation, Judge Gary agreed to the purchase, but first he wished to refer the matter to President Theodore Roosevelt. Accordingly, Judge Gary called upon President Roosevelt at the White House. The President approved in principle the purchase of the Tennessee Company by United States Steel Corporation, and in the presence of Judge Gary dictated a letter to that effect to the Attorney General of the United States. The transaction subsequently had the approval of the Federal Courts, including the United States Supreme Court.

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As a consequence of this last change in ownership and management, the Tennessee Company entered upon an era of extensive expansion and improvement, which has continued to this day.

In reporting to the stockholders in March, 1908, the United States Steel Directors stated, among other things: "It is believed the lines of business of the Tennessee Company can be materially extended. During the last two years about $6,250,000 were expended in rehabilitating, modernizing, and enlarging the furnaces and steel plant. Additional expenditures of considerable magnitude in 1908 are contemplated."

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The Year 1908 saw the completion of the construction program which had been started in 1906; installation of the new open hearth plant, including two additional 60-ton open hearth furnaces; enlargement of the blooming mill and rail mill, and other improvements designed to reduce cost and increase production.

The new management was faced with one immediate problem, that of improving the *quality* of its steel rails. A sizeable tonnage had been delivered previously but had proved wholly unsatisfactory to the purchaser, requiring replacement by other rail-producing mills of the United States Steel. Radical changes in the open hearth practice at Ensley resulted in a quality of rail that met with every requirement of the railroads, thus assuring the Company of an important outlet for a substantial part of its finished steel production.

It had been the practice of the Company to use fairly large percentages of brown ore along with red ore in the production of basic pig iron. Because of the uncertainties connected with the deposits of brown ore, efforts were put forth to change the blast furnace practice in order to use up to 100 percent red ore, the results of which were successful.

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Another problem requiring prompt solution was an adequate water supply. At that time, the rainfall in the area was so light during the latter half of each year it was necessary to operate the Ensley Works on a part-time basis. Out of this difficulty grew the impounding of Village Creek by construction of a dam across its channel not far from Ensley, thus providing a reservoir of 2,500,000,000 gallons capacity. In addition, provision was made for the re-circulation of as much water as was possible, thus reducing the quantity of make-up water to a minimum.

Many years prior to 1909, the Company had deeded to the Ensley Land Company most of the flat lying land owned by the Company, thus losing forever a large area well adapted for new plant facilities.

In anticipation of further expansion, about 1,800 acres were acquired in an area lying just southwest of Ensley, which was undivided and used primarily for farm purposes.

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The first construction on this new property was a rod mill and wire plant built and owned by American Steel and Wire Company, another subsidiary of the United States Steel Corporation.

The first by-product coke oven plant owned by the Company was erected on this new site consisting of 280 ovens. This plant began operation in 1912, at the same time as did the wire plant of the American Steel and Wire Company.

The Year 1912 marked still further noteworthy moves. The construction of a central electric power plant at Ensley was begun which, upon completion, was to supply electric power for the Ensley Works, the By-Product Coke Oven Plant, the coal washers, and the rod mill and wire plant of the American Steel and Wire Company.

At the time of acquiring property for this new plant site, an option was secured on an acreage between it and Ensley, which option later was transferred to a group of Birmingham citizens, who then organized the Corey Land Company for the purpose of developing a community properly planned along modern lines. Houses were erected for the use of the employees of the Tennessee Company and of the Wire Company. So carefully was the planning done that it created a reputation for the town as a model industrial community. This is the present City of Fairfield, well known in Alabama as a delightful community of home owning, happy, and civic-minded citizens.

Much attention was paid during these early years of ownership by United States Steel to the living and working conditions of the employees. Labor turnover rates were very high due to the very unsatisfactory provisions of housing, bath houses, and safety measures.

Not only were corrective steps taken for substantial improvement in these features, but night classes for employees on technical subjects were conducted, lecture courses carried on in the mines, and helpful additions made to the technical literature in the libraries available to the employees.

Another important feature of the program for improved conditions was the organization of the Health Department, in April of 1913.

Dispensaries and small emergency hospitals had been maintained in the various communities of the Company for the benefit of employees and members of their families, medical attention being afforded by so-called contract physicians, who operated their individual hospitals in as many as eight different localities.

The capacity of these was wholly insufficient to care for the employees, numbering in 1913 about 17,000, with the larger portion living in more or less isolated communities. The sanitation problem alone was of serious proportions and this, together with the normal incidence of disease and physical ailments, called for the creation of the Health Department, under whose jurisdiction all these elements are concentrated.

The full story of the work done and now being carried on by this department would have to be told in a separate recital, so dramatic and constructive have been the results. The elimination of diseases, chief among them being malaria, typhoid fever, and enteritis, which, prior to the inauguration of the Health Department, had beset the employees and their families, marks only one of its many accomplishments.

It is necessary only to state here that a base hospital, centrally located, was constructed where thousands of employees and their families are provided with the most modern facilities for the treatment of physical ailments under the care and direction of a full-time staff of outstanding men and women of the medical and nursing professions.

In addition to the very large program of plant rehabilitation and improvement carried out during the first nine years of the new ownership, facilities were added consisting of two 100-ton tilting open hearth furnaces, a gas producer plant, a slag crushing and pulverizing plant, and machinery for the manufacture of railroad tie plates.

The slag crushing plant calls for special comment in that it constituted another step in the program of relating the production and activities more closely to the agricultural interests of the territory served by the Company. The presence in the local iron ores

of the element phosphorus, so deleterious to the manufacture of many grades of steel, required extra time and cost in the open hearth to eliminate. In turn, this meant additional tonnages of slag to be disposed of over the slag dumps, which meant cost of hauling and cost of land to contain the dumps. Chemical analysis showed the slag to contain certain elements highly desirable in the rebuilding of soils, particularly phosphoric acid and lime. These were present in such amounts as to justify the crushing and pulverizing of the slag, packaging the resultant product, and offering it for sale as a soil conditioner, thus converting a waste product into a useful one. It must be stated here that the Tennessee Company is the only producer of this product in the United States and usually is unable to supply the full requirements of those who desire to use it.

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Coming to the period of the First World War, the annual capacity of the Company had increased to nearly 1,200,000 tons of pig iron, 700,000 tons of steel ingots, 380,000 tons of rail, and 60,000 tons of bars and plates. In 16 years, therefore, the ingot capacity had grown from nothing to a figure of 700,000 tons per year, or, starting with the first open hearth furnace construction, the capacity had about doubled.

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As its contributions to the Nation's steel needs during the First World War, the Company added materially to the facilities at Fairfield on the site purchased in 1909. A new plate mill of a width of 110 inches, a 45-inch blooming mill, a combination bar and structural mill, together with shops equipped for furnishing structural material for a proposed shipbuilding plant, were constructed.

This shipbuilding plant was built at Chickasaw, Alabama, just north of Mobile, consisting of 10 shipways with necessary auxiliary buildings and facilities and dwelling houses for employees constructed on a town site laid out adjacent to the plant. Electric lighting and water systems were provided, an electric railway built to connect with that of the Mobile Light & Railroad Company

for the transportation of employees and others, and a contract entered into with the Mobile Electric Company for supply of power for the needs of the town and plant.

In the Year 1918, practically the entire output of the Company was devoted to the wartime needs of America. Also, the By-Product Coke Oven Plant at Fairfield was enlarged through the erection of 154 new ovens, two gas coolers, and an addition to the benzol recovery plant to meet the requirements for toluol, benzol, and ammonium sulphate.

At Ensley Works, an additional open hearth furnace, a Bessemer converter, a 400-ton hot metal mixer, and other improvements were installed.

For the employees in the Birmingham District some 465 houses were built at the several ore and coal mines, and nearly 1,000 houses built at Fairfield and Westfield, together with a school building for employees' children.

The last of the 14 ships constructed at Chickasaw was delivered in September, 1921, and operations there were suspended. In order to utilize the facilities at Fairfield which had been installed for shipbuilding purposes, the Fairfield Car Works was established with a capacity of 6,000 steel cars annually, and for rebuilding and repairing 4,500 cars. Up until that time (1922), the production of the Company was confined largely to materials for railroads. In order to secure a more uniform load factor in the primary steel-making facilities, it was deemed essential to diversify the finished products through construction of additional finishing facilities.

By the end of 1925, there had been completed at Fairfield a new four-furnace open hearth plant, a sheet and jobbing mill, a 21-inch sheet bar and billet mill, and a rail fastening department; and marked progress had been made on the extension to the sheet mills.

There had been authorized for construction at these works two new blast furnaces, a power plant, four additional open hearth furnaces, and an addition of 77 coke ovens to the By-Product Plant.

Of unusual interest was the completion of the High Line, which consists of a standard-gauge railroad track resting mainly on an embankment constructed at an elevation sufficiently high to eliminate, by means of underpasses, all grade crossings of highways and of steam and electric railroads. This afforded uninterrupted service between the ore mines and Fairfield blast furnaces.

This facility, completely equipped with automatic electric block signal system, continues to prove of tremendous value to the Company both in the matter of complete elimination of hazard to the public and in the transportation cost of the millions of tons of ore hauled over it each year.

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During the next three years, further progress was made upon the program of diversification and improvement. A new coal shaft was sunk at the Hamilton Mine, 63 additional by-product coke ovens were finished, as was a 12-inch cotton tie mill, the two new blast furnaces at Fairfield were blown in, and two additional sheet mills were put in production.

The operation of a water transportation system between Birmingport and Mobile was established, using two Diesel-electric towboats and a fleet of barges. The barges were of combination river and sea-going type, thus permitting shipment from Birmingport to various Gulf ports.

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In the early part of 1929, the Company sold its carbuilding equipment and facilities to the Pullman Car Manufacturing Company, whereupon that company constructed its modern plant at Bessemer and installed this equipment, thus continuing in the District the manufacture of railroad cars.

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As new and up-to-date facilities were installed it became possible to abandon some of the older ones; thus the Alice, two Oxmoor, and the Bessemer blast furnaces were dismantled, and only the Ensley and Fairfield furnaces kept in operating condition.

Since the Year 1930 marked a change in the Presidency of the Company, it might be timely to review the progress made under the ownership of the United States Steel Corporation:

An increase in annual rated steel ingot capacity from something less than 700,000 tons in 1907 to 1,750,000 tons in 1930; a much greater diversification of products; lower costs of production and expansion of the Company's markets; improved metallurgical practice; replacement of beehive coke ovens with modern by-product ovens; the concentration at Ensley and Fairfield of the major part of mill and furnace operations; and the abandonment of older and less efficient facilities, both mines and furnaces. All of these steps bear evidence of the foresight and wise judgment which marked the administration of these 22 years.

Of even greater importance—the improvement in personnel; the cancellation (in 1912) of the convict lease in the coal mines division; the betterment of employees' living and working conditions; welfare activities; substantial improvement in safety provisions; the hospital and medical care—all were a part of this 22-year program.

Finally, a start had been made in the development of a Farm Products Division whose entire effort was directed to sincere cooperation with the agricultural interests of the several States in the Company's territory.

The story of this program and its subsequent development might well be the subject of another Newcomen address, so helpful and constructive has it been to our agricultural friends and indeed to the whole economy of the South.

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During the next several years, the operations of the Company suffered, in the same manner as did all business, from economic conditions that ranged from excellent to pitiful—yet improvements to the manufacturing and mining facilities were continued.

In 1930, enlargements and alterations of the sheet mills, construction of a new 42-inch universal strip mill and a new open hearth furnace at Fairfield—all took place.

In 1932, substantial improvements in the finishing facilities at the bar mill and structural mill were made.

In 1933, the rod mill and wire works, completed in 1912 by the American Steel and Wire Company at Fairfield, were acquired by the Tennessee Company, thus adding to the diversity of products of its own manufacture available to its customers.

In 1935, increased finishing facilities were provided at the 110-inch plate mill, and additions were made to hot mills, pickling, and galvanizing departments to increase capacity for sheets which had become an increasingly important product.

In 1936, there was announced at a large gathering of representative citizens of the district, a large program covering installation of facilities for production of cold reduced tin plate. This was the first cold reduced tin plate mill to be built in the South and marked a very important step in operations of the Company.

The program provided for extensive improvements at the ore and coal mines to meet additional raw material requirements; for the installation of two five-stand four-high cold reduction mills with the necessary auxiliary facilities; a 48-inch hot strip mill; 45-inch blooming mill; and two new by-product coke oven batteries of 73 ovens each, replacing two obsolete batteries.

Early in 1936, the Virginia Bridge Company, a wholly-owned subsidiary of the Tennessee Company, acquired the properties of the Virginia Bridge and Iron Company, consisting of fabricating plants located at Roanoke, Virginia; Birmingham, Alabama; and Memphis, Tennessee.

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The Year 1937 was a busy one, with the demand for steel products so great as to justify full operations of the Company's facilities and with the extensive construction program rapidly being pushed to completion in order to begin the production of tin plate at the earliest possible moment.

Shortly after the first of 1938, the tin mill facilities were put into operation and the first shipment of the output of this mill was made in March of that year.

During 1938, much progress was made in the program of extensive mechanization of the coal mines, mechanical conveyors being installed in three of the four producing mines.

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The following year was to see the Second World War break upon Europe. The effects of its outbreak immediately were noticeable in the United States. Especially was this true of the Steel Industry, which was called upon almost at once to step up its output to provide material necessary for the construction of shipyards, aircraft factories, and similar facilities needed by this Nation and its Allies.

Due to the large program designed for the South in this respect, the operations of the Tennessee Company were stepped up to 100 percent of capacity as early as September, 1939, and remained at that rate throughout the succeeding years up to this hour, except for the several severely crippling work stoppages on the part of various groups of employees.

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Fortunately, the construction and enlargement program previously begun was so well advanced when the war demand fell upon the Company that it was in position to take the load without undue strain in the first year or two. The construction of an ore conditioning and sintering plant was well under way, which was designed to size the ore from the mines and stock it in known chemical groups, thus affording an improved output of existing blast furnaces.

So heavy did the pressure become for more steel that a further program for increase in capacity was inaugurated in 1940. This provided for enlargement of the ore conditioning plant on Red Mountain, a new blast furnace at Fairfield, a new battery of by-product coke ovens, a new 140-inch plate mill, facilities for the production of shell forgings, and additions to the tin mill and to the sheet mills.

Early in 1941, the Company purchased a small blast furnace at Holt, Alabama, which had been out of blast for many years. This

furnace was rehabilitated and put into production of merchant iron in order to supply part of the need of that essential commodity.

Other important developments took place during the war years of 1941 to 1945; the reopening of an ore mine; the opening of a new coal mine, known as the Short Creek Mine; the installation of facilities for the production of electrolytically coated tin plate; two new steam generators; a new turbo blower at Fairfield; and a 25,000 K.V.A. turbo generator.

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The end of the Second World War in 1945 brought with it the need for keen analysis of economic conditions, both at home and Abroad. It was evident that a tremendous backlog of demands had accumulated during the war years, especially in steel products, because such a vast proportion of the steel output had been absorbed by the needs of war, leaving practically none available for ordinary commercial requirements. In addition, the Steel Industry was confronted with the problem of supplying our foreign allies with tonnages of steel far greater in amount than ever before in history.

In the United States, we were faced with another condition over and beyond the heavy backlog of deferred purchases. The men and women remaining at home during the war years had been fully employed at rates of pay which rose gradually over that period and thus created a buying power and a desire for more of the conveniences made of steel than had existed before.

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As a partial measure of this, let us look once more at the figures of business activity in the several Southern States used earlier as a guide.

In 1947, the population of those eight States had increased from 20,790,000 in 1940 to 21,807,000, or not quite five percent; but the value of agricultural products had grown from $1,177,000,000 in 1939 to $3,541,000,000 in 1947, or about 300 percent; the gross postal receipts in 1940 amounted to $58,000,000 while in 1947 they had reached a figure of over $107,000,000, or nearly double the 1940 figure; and the value of manufactured goods

amounted to $4,780,000,000 in 1939 while in 1946 this figure was $11,315,000,000, or more than double the prewar figure.

The Company's management thus was faced with a necessity of deciding how much of the then current demand for its products was normal and likely to obtain for some years to come and *how much* was only the requirements needed to fill the gap created during the war years and thus of a temporary nature, comparatively speaking.

To build new capacity to the extent proposed by some agencies would require years of construction and the use of large tonnages of the identical steel so urgently needed by the public generally. Steel mills are not constructed and brought into production overnight, nor can the use of large sums of capital be justified on a purely temporary requirement basis.

In the light of these considerations, the decision was reached that certain new facilities were essential, and work was begun on a new coal mine at Concord; a new 190-ton open hearth furnace at Fairfield; and a completely new sheet mill for the production of cold reduced sheets, a commodity never before produced in the South. To increase the output of basic iron needed for the new open hearth furnace, improved mechanical devices were ordered for use in the ore mines. Negotiations also were entered into with both Brazilian and Swedish interests for the delivery by them to us of substantial tonnages of ore far richer in iron content than the red ore of the Birmingham District.

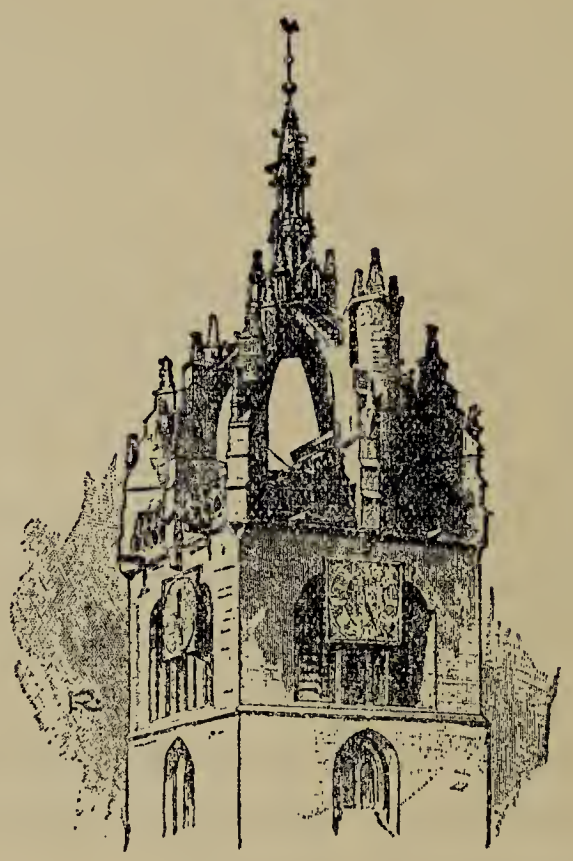
At the moment this manuscript is written, the new open hearth furnace is in production, coal is being shipped daily from the new Concord Mine, the imported ores to supplement domestic supplies are in current use in the blast furnaces, and the new cold reduction mill for sheet production is in operation.

What the future may hold as regards the further developments of The Tennessee Coal, Iron and Railroad Company is not a part

of this address, but it must be evident to all that the Company has endeavored to keep apace or ahead of the requirements of its trade territory throughout the nearly 100 years of its existence. This should be a clear-cut indication of what might be expected in the years ahead.

THE END

"Actorum Memores simul affectamus Agenda!"



In Just Tribute

Throughout this condensed story of the origin and development of the Tennessee Company little or nothing has been said about *the men* whose brains, energy, and efforts made possible the great production machine it is today.

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It would be most unfair to close without calling the roll of many of these men: Samuel F. Tracy; Return J. Meigs; Arthur S. Colyar; James H. Ewin; James W. Manier; William Morrow; A. M. Shook; Nat Baxter, Jr.; James C. Warner; Enoch Ensley; John C. Brown; Thomas C. Platt; Don H. Bacon; and later, George G. Crawford; Herbert C. Ryding; and John L. Perry.

And the list could be lengthened with the names of those who, though in somewhat lesser official responsibility, contributed so substantially through the years. Failing to name this great legion, I do pay sincere tribute to their fine effort and their many high achievements.

R.G.

Acknowledgments

Much of the material in this paper was taken from that excellent book written some years ago by Miss Ethel Armes, the "Story of Coal and Iron in Alabama." One of her surviving brothers, Colonel Edmund Armes, graciously granted permission to use parts of the results of her years of study and research which went into that book.

Mr. Paschal G. Shook was kind enough to make available certain documents from his personal files, which were most helpful, as he was an important factor in the Company during the 90's as his distinguished father, Colonel A. M. Shook, had been for many years.

This records my sincere thanks and deep appreciation for the assistance thus rendered in the preparation of this paper.

R.G.

THIS NEWCOMEN ADDRESS, *dealing with the origin and development of Tennessee Coal, Iron and Railroad Company, was delivered during the "1948 Alabama Dinner" of The Newcomen Society of England, held at Mountain Brook Club, near Birmingham, Alabama, U.S.A., on December 7, 1948.* DR. GREGG, *the guest of honor, was introduced by the* SENIOR VICE-PRESIDENT FOR NORTH AMERICA, *in this international Society whose headquarters are at London. The dinner was presided over by* DR. THOMAS W. MARTIN, *President, Alabama Power Company, the Chairman of the Alabama Committee, in American Newcomen.*

"During the War between the States, the company's property had adventurous times: in the Year 1861, the Confederate Army seized the property and operated the mines and the railroad until that army evacuated Tennessee, taking with it all the equipment of the railroad. In 1862, when middle Tennessee was first occupied by the Federal forces, the property was commandeered by that army and was operated in a desultory fashion until the close of the war, in 1865."

—Robert Gregg

"What the future may hold as regards the further developments of The Tennessee Coal, Iron and Railroad Company is not a part of this Newcomen Address, but it must be evident to all that the Company has endeavored to keep apace or ahead of the requirements of its trade territory throughout the nearly 100 years of its existence. This should be a clear-cut indication of what might be expected in the years ahead."

—Robert Gregg

AMERICAN NEWCOMEN *takes satisfaction in this manuscript by one of the outstanding industrialists in the South, whose recital gives an infinitely human picture of the lives and times, the hardships and difficulties, the failures and successes of those pioneers, beginning nearly a century ago, whose efforts culminated in the great industrial enterprise that has contributed not only to the South but to all of Amercia. It is a chapter of absorbing interest in the history of Material Civilization.*

THE NEWCOMEN SOCIETY OF ENGLAND

IN NORTH AMERICA

BROADLY, *this British Society has as its purposes: to increase an appreciation of American-British traditions and ideals in the Arts and Sciences, especially in that bond of sympathy for the cultural and spiritual forces which are common to the two countries; and, secondly, to serve as another link in the intimately friendly relations existing between Great Britain and the United States of America.*

The Newcomen Society centers its work in the history of Material Civilization, the history of: Industry, Invention, Engineering, Transportation, the Utilities, Communication, Mining, Agriculture, Finance, Banking, Economics, Education, and the Law—these and correlated historical fields. In short, the background of those factors which have contributed or are contributing to the progress of Mankind.

The best of British traditions, British scholarship, and British ideals stand back of this honorary society, whose headquarters are at London. Its name perpetuates the life and work of Thomas Newcomen (1663-1729), the British pioneer, whose valuable contributions in improvements to the newly invented Steam Engine brought him lasting fame in the field of the Mechanic Arts. The Newcomen Engines, whose period of use was from 1712 to 1775, paved a way for the Industrial Revolution. Newcomen's inventive genius preceded by more than 50 years the brilliant work in Steam by the world-famous James Watt.

"The roads you travel so briskly
lead out of dim antiquity,
and you study the past chiefly because
of its bearing on the living present
and its promise for the future."

—LIEUTENANT GENERAL JAMES G. HARBORD,
K.C.M.G., D.S.M., LL.D., U.S. ARMY (RET.)
(1866-1947)
Late American Member of Council at London
The Newcomen Society of England